FUEL SUPPLY SYSTEM COMPONENTS, REMOVING AND INSTALLING

NOTE:

- **Hose connections are secured with either spring-type or clamp-type clips.**
- **Always replace clamp-type clips with spring-type clips.**
- **Fuel hoses in the engine compartment must be secured only with spring-type clips. The use of clamp or screw-type clips is not permitted.**
- **Assembly tool VAS 5024 or hose clip pliers V.A.G 1921 are recommended for installing spring-type clips.**

Servicing fuel filter, See **FUEL FILTER, SERVICING** .

Observe safety precautions, See **SAFETY PRECAUTIONS WHEN WORKING ON THE FUEL SUPPLY SYSTEM** .

Observe rules for cleanliness, See **RULES FOR CLEANLINESS** .

Servicing accelerator mechanism, See **ACCELERATOR MECHANISM, SERVICING** .

FUEL TANK, REMOVING AND INSTALLING

NOTE: The following list refers to items in Fig. 1 .

1. **Cap**
2. **Seal**
   - Replace if damaged
3. **1 N.m**
4. **Tank flap unit**
   - With rubber cup
5. **Ground connection**
6. **O-ring**
   - Always replace
7. **Vent valve**
   - To remove valve unclip sideways out of support
   - Remove cap item 1 before installing
   - Checking, See **Fig. 3** .
8. **6 N.m**
9. **Protective cover**

- For filler neck

10. **Vent line**
    - Check for secure seating
11. **Clamping washer**
12. **Heat shield**
13. **Fuel tank cover**
14. **20 N.m plus an additional 90° (1/4 turn)**
    - Always replace
15. **Mounting strap**
    - Note different lengths
16. **Fuel tank**
    - When removing, support with engine/transmission jack V.A.G 1383 A
    - Removing and installing, See **FUEL TANK, REMOVING AND INSTALLING**
17. **Seal**
    - Replace if damaged
    - When installing, insert seal "dry" into fuel tank opening
    - Moisten inner edges of seal with fuel when installing fuel gauge sensor
18. **Fuel gauge sensor**
    - Observe installed position on fuel tank, See **Fig. 2**
    - Removing and installing, See **FUEL DELIVERY UNIT, REMOVING AND INSTALLING** .
    - Check fuel gauge signal sensor, See **FUEL GAUGE SENSOR, CHECKING**
    - Check fuel pump. See **FUEL PUMP, CHECKING ELECTRICALLY** and **DELIVERY PRESSURE AND DELIVERY RATE OF FUEL PUMP, CHECKING** .
19. **Union nut**
    - Remove and install with key 3217
20. **Supply line**
    - Black
    - To fuel filter, See **FUEL FILTER, SERVICING**
    - Clipped onto fuel tank
    - Check for secure seating
    - Press locking ring inward to release fuel line of fuel gauge sensor
21. **Return hose**
    - Blue
    - From fuel cooler, See **FUEL COOLER, REMOVING AND INSTALLING**
    - Clipped onto fuel tank
    - Check for secure seating
    - Press locking ring inward to release fuel line of fuel gauge sensor

22. **Distance piece**
23. **Gravity/overflow valve**
    - Check valve for through flow:

      Valve vertical: Open,

      Valve tilted 45°: Closed

24. **10 N.m**

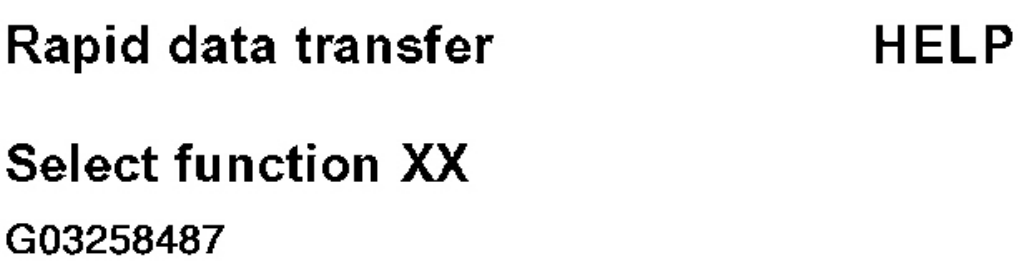

Fig. 1: Exploded View Of Fuel Tank Assembly
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Fuel gauge sensor, installed position

Mark on flange must align with mark on fuel tank (arrows).

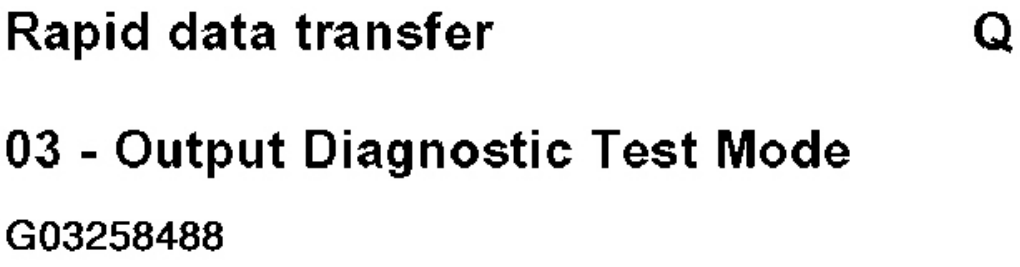

Fig. 2: Mark On Fuel Gauge Sensor Flange Must Align With Mark On Fuel Tank
Courtesy of VOLKSWAGEN OF AMERICA, INC.

NOTE: After installing fuel gauge sensor, check that the supply -2- and return lines -1- are still clipped onto fuel tank.

Vent valve, checking

Lever in rest position: Closed

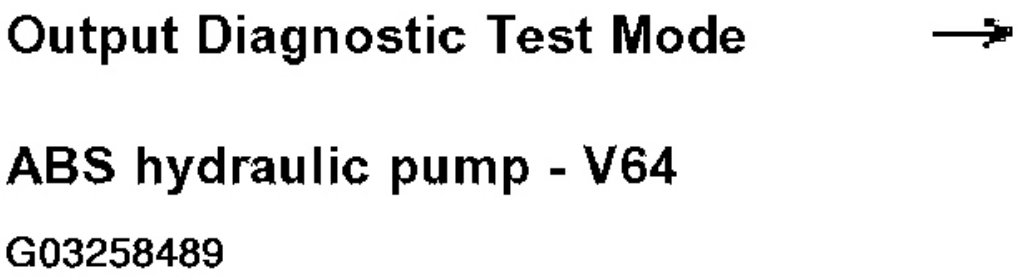

Fig. 3: Checking Vent Valve
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Lever pushed in direction of arrow: Open

NOTE: Before installing breather valve, unscrew filler cap from fuel tank.

FUEL FILTER, SERVICING

The flow direction is marked by an arrow on the fuel hose, the preheat valve and the fuel filter.

NOTE: The following list refers to items in Fig. 4 .

1. **Return hose**
   - To fuel cooler, See **FUEL COOLER, REMOVING AND INSTALLING**
   - Open lower spring-type clamp
   - Blue or with blue marking
   - Check for secure seating
2. **Supply line**
   - From fuel tank
   - White or with white marking
   - Check for secure seating

3. **O-ring**
    - Always replace
4. **Securing clip**
    - Replace if damaged
5. **Protective plate**
    - Note installation position
6. **Control valve**
    - Installed position: Arrow points toward fuel tank
    - When changing filter, remove retaining clip and protective plate and take off preheat valve with hoses remaining connected. Replace O ring and coat with fuel before installing.
    - **Below + 15°C:**

      Passageway to filter open

    - **Over + 31°C:**

      Passageway to filter closed

7. **Return line**
    - From tandem pump
    - Open lower spring-type clamp
    - Check for secure seating
8. **Supply line**
    - To tandem pump
    - Check for secure seating
9. **Fuel filter**
    - Fill with diesel before installing
    - Flow direction is marked by arrows
    - Do not interchange connections
    - Replace if damaged
10. **Tensioning bolt, 2 N.m**
11. **Bracket**
    - Slide onto upper stop of fuel filter
12. **Water drain plug**
    - To bleed: remove retaining clip and protective plate and remove preheat valve with hoses remaining connected
    - Loosen and allow approx. 100 cc of fluid to drain
13. **Seal**
    - Replace if damaged.

14. **10 N.m**

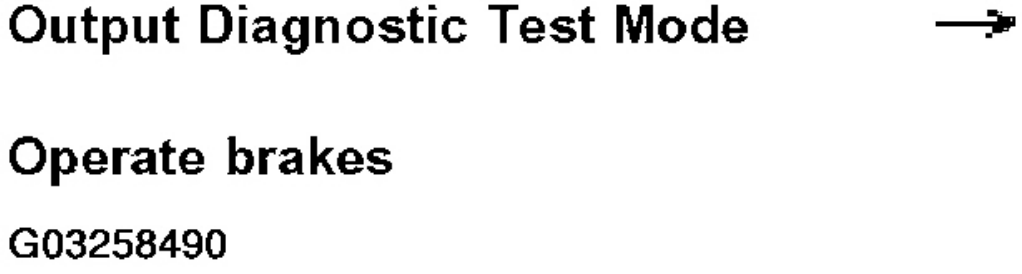

Fig. 4: Identifying Fuel Filter Assembly
Courtesy of VOLKSWAGEN OF AMERICA, INC.

SAFETY PRECAUTIONS WHEN WORKING ON THE FUEL SUPPLY SYSTEM

CAUTION: When performing repair work, especially due to the confined conditions in the engine compartment, pay attention to the following:

- **Route all types of hoses/lines (e.g. for fuel, hydraulics, EVAP system, coolant, refrigerant, brake fluid and vacuum) as well as electrical wiring so that the original positions are restored.**
- **Ensure sufficient clearance to all moving or hot components.**

WARNING:

- **The fuel and the fuel lines in the fuel system can become very hot (danger of scalding)!**
- **The fuel system is under pressure! Before opening the system, place cloths around the connections. Then carefully loosen the connection to release pressure**
- **Wear eye and hand protection when performing any type of repair work on the fuel system!**

When removing and installing the fuel gauge sensor from a full or partly full fuel tank, observe the following:

- Before starting repairs, switch on exhaust extraction system and place an extraction hose close to the sensor opening in the fuel tank to extract escaping diesel fuel fumes. If no exhaust extraction system is available, a radial fan (as long as motor is not in air flow) with a displacement greater than 15 m^3 /h can be used.
- Avoid fuel contact with skin! Wear fuel-resistant gloves!

RULES FOR CLEANLINESS

When working on the fuel supply/injection system, pay careful attention to the following rules:

- Thoroughly clean all unions and adjacent areas before disconnecting.
- Place parts that have been removed on a clean surface and cover. Do not use fluffy cloths!
- Carefully cover opened components or seal if repairs cannot be carried out immediately.
- Only install clean components: Only unpack replacement parts immediately prior to installation. Do not use parts that have been stored loose (e.g. in tool boxes etc.).
- When the system is open: Do not work with compressed air if this can be avoided. Do not move vehicle unless absolutely necessary.
- Make sure that no diesel fuel runs onto the coolant hoses. Immediately clean any accidental hose contamination. Affected hoses must be replaced.

FUEL COOLER, REMOVING AND INSTALLING

Observe safety precautions, See **SAFETY PRECAUTIONS WHEN WORKING ON THE FUEL SUPPLY SYSTEM** .

Observe rules for cleanliness, See **RULES FOR CLEANLINESS** .

Special tools and equipment

- V.A.G 1331 Torque wrench (5 to 50 N.m)

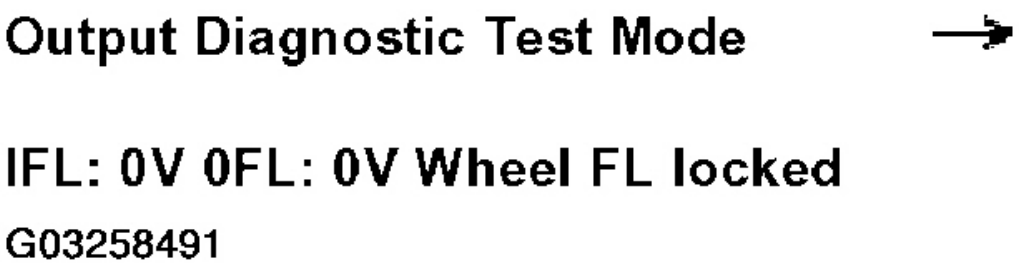

Fig. 5: Identifying Special Tools And Equipment (V.A.G 1331)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Removing

NOTE: The fuel cooler is located in the fuel return line to the tank. It is located on the

vehicle underbody.

- Remove cover -A-.
- Separate fuel lines at fuel cooler.

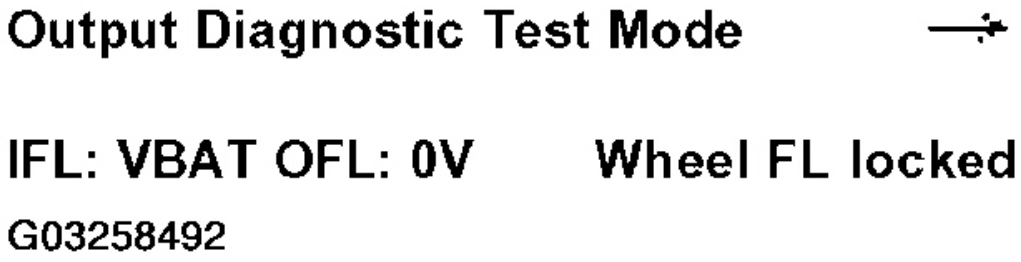

Fig. 6: Locating Fuel Cooler
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Remove securing nuts (arrows).

Installing

Installation is performed in the reverse sequence of removal. Note the following:

- Tighten fuel cooler securing nuts to 20 N.m.

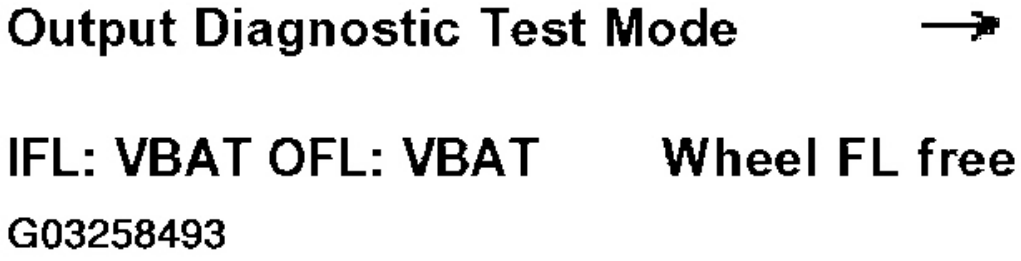

Fig. 7: Removing Fuel Cooler Securing Nuts
Courtesy of VOLKSWAGEN OF AMERICA, INC.

FUEL DELIVERY UNIT, REMOVING AND INSTALLING

Observe safety precautions, See **SAFETY PRECAUTIONS WHEN WORKING ON THE FUEL SUPPLY SYSTEM** .

Observe rules for cleanliness, See **RULES FOR CLEANLINESS** .

Special tools and equipment

- 3217 Ring nut wrench

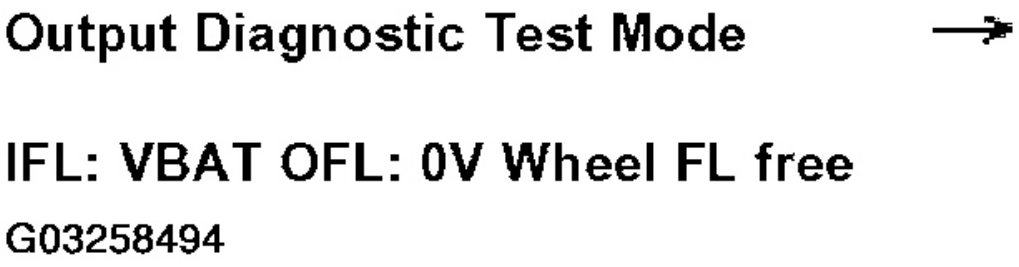

Fig. 8: Identifying Special Tools And Equipment (3217 Ring Nut Wrench)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Removing

- Check whether a coded radio is installed. If so, obtain anti-theft coding.
- With ignition switched off disconnect battery Ground (GND) strap.
- Fold rear seat bench forward.
- Remove cover from fuel delivery unit.

WARNING:

- **The fuel and the fuel lines in the fuel system can become very hot (danger of scalding)!**
- **The fuel system is also under pressure! Before opening the system, place cloths around the connections. Then carefully loosen the connection to release pressure**
- **Wear eye and hand protection when performing any type of repair work on the fuel system!**

- 4-pin connector as well as supply and return lines must be disconnected from the fuel delivery unit.

NOTE: Press locking ring inward to release fuel lines.

- Remove union nut with wrench 3217.
- Pull fuel gauge sensor and seal out of opening in fuel tank.

NOTE: If the delivery unit is to be replaced drain old delivery unit before disposal.

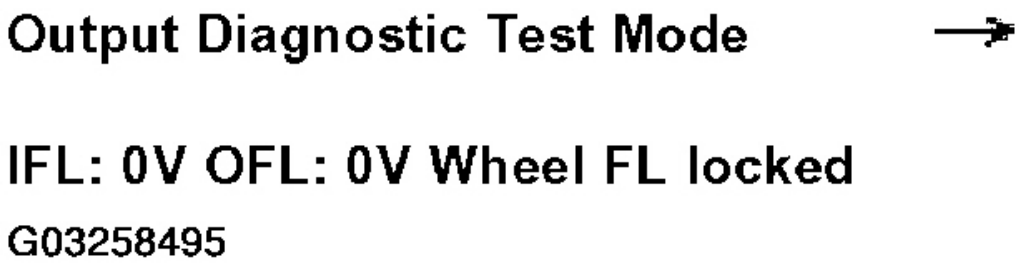

Fig. 9: Removing Fuel Gauge Sensor Union Nut With Wrench
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Installing

- Installation of the fuel delivery unit is performed in reverse order.

NOTE:

- **Do not bend fuel sensor when installing.**
- **Insert fuel delivery unit seal dry into fuel tank opening.**
- **Moisten inner edges of seal with fuel only when installing fuel delivery unit.**
- **Note installation position of fuel gauge sensor: The marking on the fuel delivery unit must align with marking on fuel tank (arrows).**

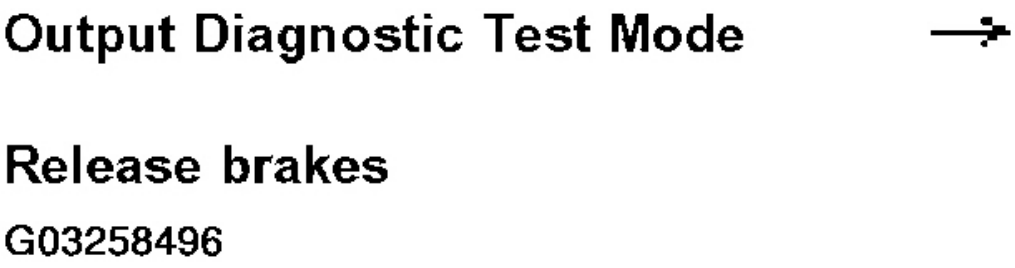

Fig. 10: Aligning Fuel Delivery Unit Marking With Marking On Fuel Tank
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- **After installing fuel delivery unit, check that the supply -2- and return lines -1- are still clipped onto fuel tank.**

- Check Diagnostic Trouble Code (DTC) memory. See **ENGINE CONTROL MODULE (DTC) MEMORY, READING AND ERASING** .

FUEL GAUGE SENSOR, REMOVING AND INSTALLING

Removing

- Remove fuel gauge sensor. See **FUEL DELIVERY UNIT, REMOVING AND INSTALLING** .
- Unlock line connector -1 - and -2- and pull off.
- Lift up retaining tabs -3- and -4- using a screwdriver and pull fuel sensor off downward (arrows).

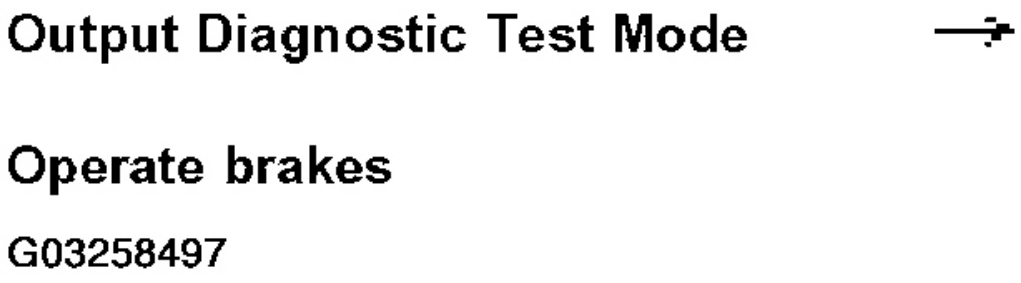

Fig. 11: Removing And Installing Fuel Delivery Unit Connectors

Courtesy of VOLKSWAGEN OF AMERICA, INC.

Installing

- Insert fuel gauge sender in guides on fuel gauge sensor and push up until it engages.
- Connect connectors and check for secure fit.
- Install fuel gauge sensor, See **FUEL DELIVERY UNIT, REMOVING AND INSTALLING** .

FUEL GAUGE SENSOR, CHECKING

Special tools and equipment

- V.A.G 1526 Multimeter

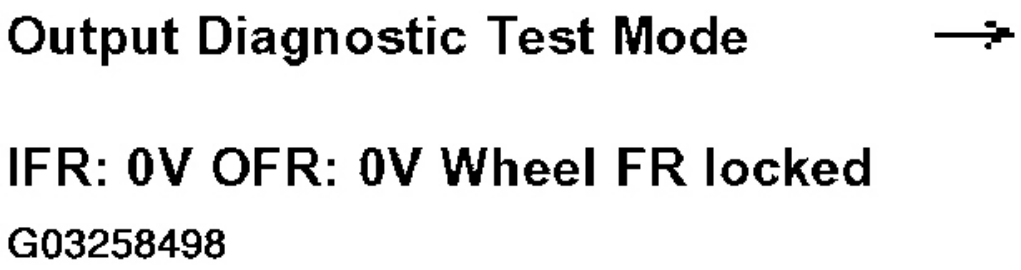

Fig. 12: Identifying Special Tools And Equipment (V.A.G 1526 Multimeter)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- V.A.G 1594 A Adapter set

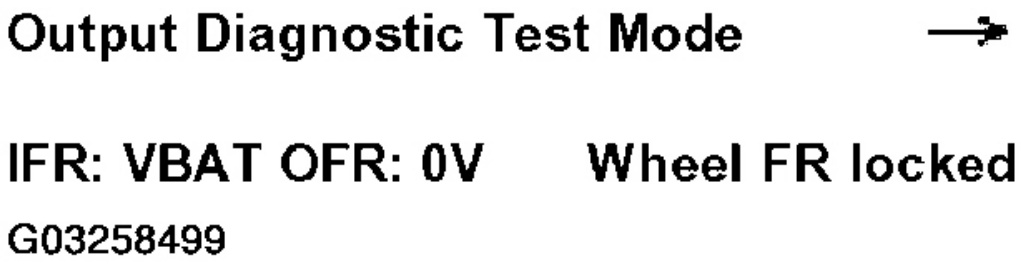

Fig. 13: Identifying Special Tools And Equipment (V.A.G 1594 A Adapter Set)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Work sequence

- Remove cover from fuel gauge sensor.
- Disconnect 4-pin connector from flange on fuel gauge sensor.
- Measure resistance at contacts -2- and -3- on sealing flange.

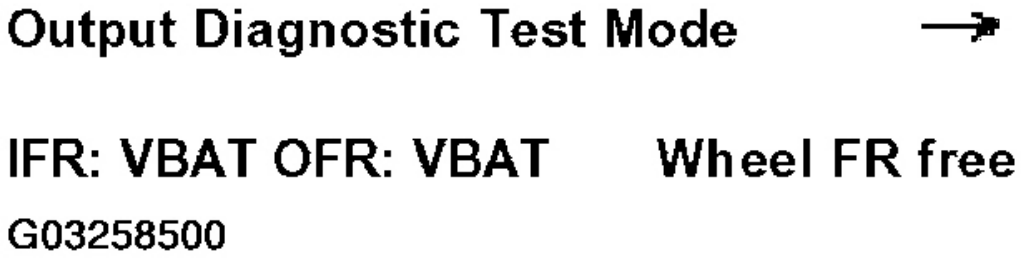

Fig. 14: Measuring Resistance At Contacts -2- And -3- On Fuel Gauge Sensor Sealing Flange
Courtesy of VOLKSWAGEN OF AMERICA, INC.

FUEL GAUGE SENSOR RESISTANCE

Sensor	Fuel tank full	Fuel tank empty
Fuel gauge sensor	295 ohms	52 ohms

With a fuel gauge between "full" and "empty" there must be indicated a resistance value between both specifications.

If 0 ohm or infinite ohms is measured, there is a wiring open or short circuit.

NOTE: To check the resistance values "full" or "empty", the fuel gauge sensor must be removed and the sensor float moved to the upper or lower stop. See FUEL GAUGE SENSOR, REMOVING AND INSTALLING .

FUEL TANK, REMOVING AND INSTALLING

Observe safety precautions, See **SAFETY PRECAUTIONS WHEN WORKING ON THE FUEL SUPPLY SYSTEM** .

Observe rules for cleanliness. See **RULES FOR CLEANLINESS** .

Special tools and equipment

- V.A.G 1331 Torque wrench (5 to 50 N.m)

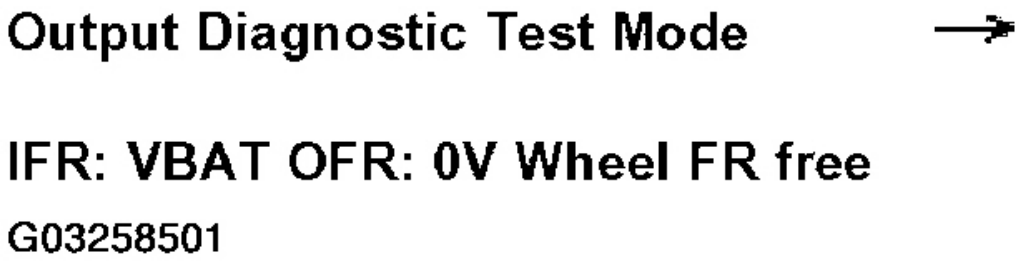

Fig. 15: Identifying Special Tools And Equipment (V.A.G 1331 Torque Wrench)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- V.A.G 1383 A Engine/transmission jack

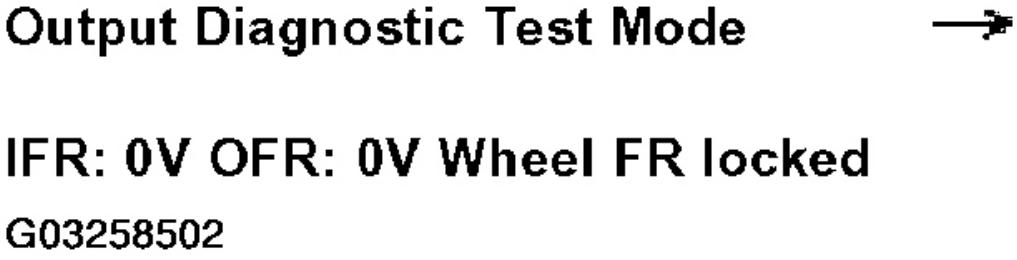

Fig. 16: Identifying Special Tools And Equipment (V.A.G 1383 A Engine/Transmission Jack)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Removing

- Open fuel flap.
- Check whether a coded radio is installed. If so, obtain anti-theft coding.
- With ignition switched off disconnect battery Ground (GND) strap.
- Remove tank flap unit with rubber cup.

See **FUEL TANK FILLER FLAP UNIT, REMOVING AND INSTALLING** .

- Fold rear bench seat forward.
- Remove cover from fuel gauge sensor and separate connection.
- Remove rear axle:

  See **AXLE BEAM** .

- Remove rear right wheelhouse liner:

  See **REAR WHEEL HOUSINGS LINER, ASSEMBLY OVERVIEW** .

- Unscrew protective cover -1- (arrows).

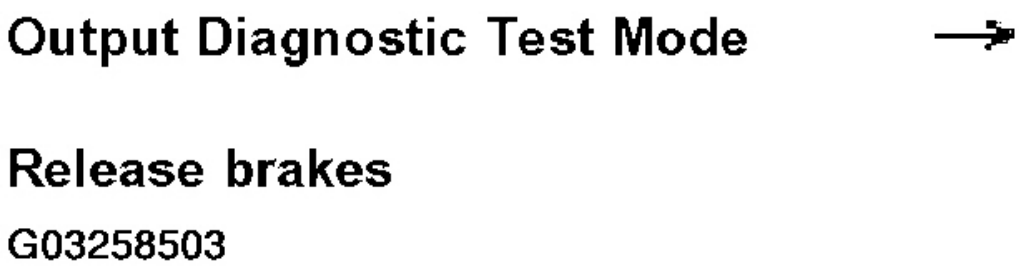

Fig. 17: Unscrew Protective Cover
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Remove cover for fuel tank (arrows).

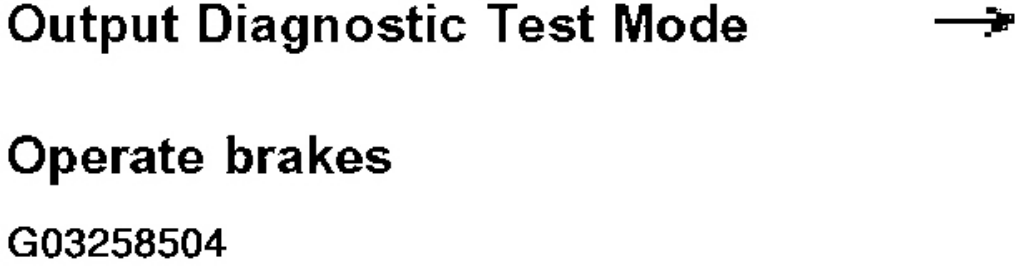

Fig. 18: Removing Fuel Tank Cover
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Drain fuel tank and clean area of fuel filler neck (unscrew filler cap).
- Disconnect breather lines/hoses on filler neck.
- Remove gravity valve from its retainer.
- Remove mounting screws on filler neck.

WARNING:

- **The fuel and the fuel lines in the fuel system can become very hot (danger of scalding)!**
- **The fuel system is also under pressure! Before opening the system, place cloths around the connections. Then carefully loosen the connection to release pressure.**
- **Wear eye and hand protection when performing any type of repair work on the fuel system!**

- Disconnect supply and return lines on right front of fuel tank.

NOTE: Press locking ring inward to release fuel lines (arrows).

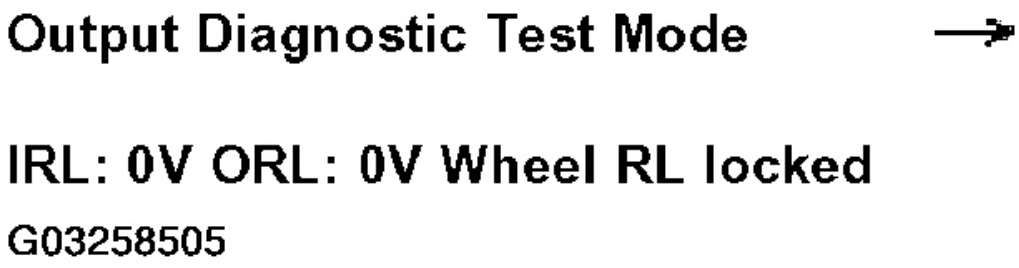

Fig. 19: Disconnecting Supply And Return Lines On Right Front Of Fuel Tank
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Seal lines so that fuel system is not contaminated by dirt etc.
- Remove tensioning strap. When doing this support fuel tank with engine/transmission jack V.A.G 1383 A.
- Lower fuel tank. Guide vent hoses/lines through longitudinal member.

Installing

Installation is performed in the reverse order. Note the following:

- Route breather and fuel lines free of kinks.
- Make sure fuel lines/hoses are installed securely.
- Guide vent hoses/lines through opening in longitudinal member (install line guide).
- Secure breather hoses/lines to filler neck with spring-type clamps.
- Do not interchange supply and return hose (return hose blue, supply hose black).
- Clip supply and return line onto fuel tank.

FUEL PUMP, CHECKING ELECTRICALLY

Special tools and equipment

- V.A.G 1527 B Diode test lamp

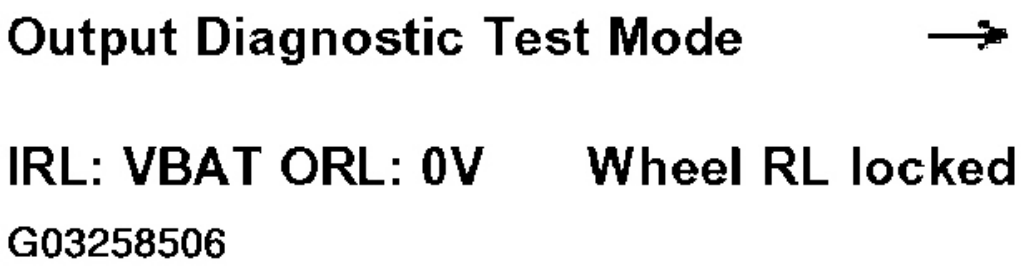

Fig. 20: Identifying Special Tools And Equipment (V.A.G 1527 B Diode Test Lamp)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- V.A.G 1715 Multimeter
- Wiring diagram

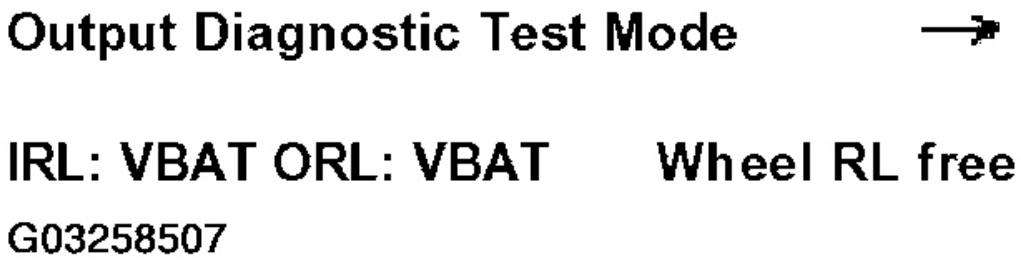

Fig. 21: Identifying Special Tools And Equipment (V.A.G 1715 Multimeter)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Requirements

- Battery charge at least 11.5V
- Fuses OK
- All electrical consumers, e.g. lights and rear window defogger are switched off

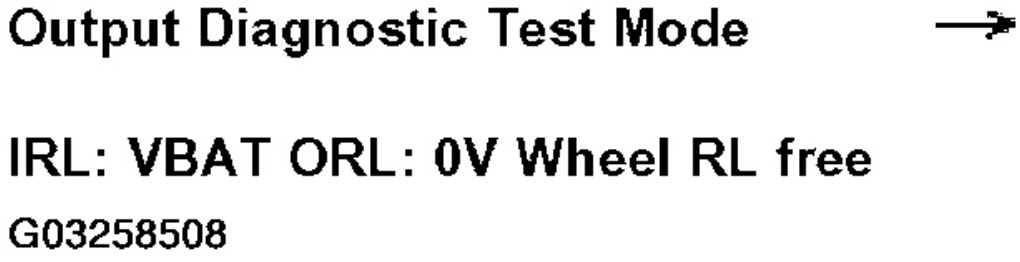

Fig. 22: Identifying Fuses (Behind Trim Panel On Far Left Side Of Dash)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Checking function and voltage supply

- Remove cover from fuel gauge sensor.
- Switch ignition on. Fuel pump must be heard to run for approx. 2 seconds.
- Switch ignition off.

If fuel pump does not run:

- Disconnect 4-pin connector from flange on fuel gauge sensor.
- Connect diode test lamp V.A.G 1527 with adapter cables from V.A.G 1594 to outer contacts of connector.

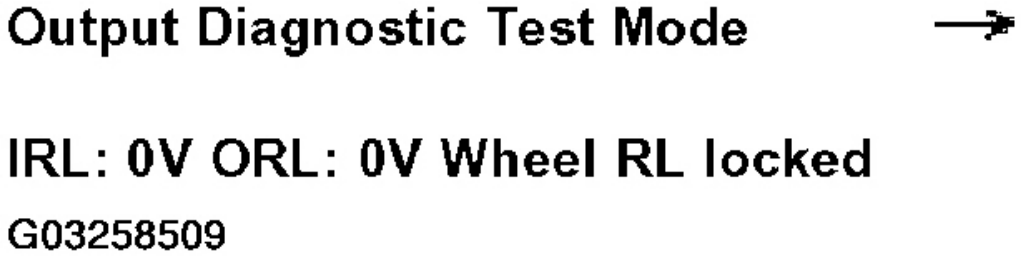

Fig. 23: Connecting Diode Test Lamp With Adapter Cables To Outer Contacts Of Connector
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Switch ignition on.

  LED must light up for approx. 2 seconds.

LED does not light up:

- Check activation of fuel pump relay and check wiring for open and short circuit.

  See appropriate System Wiring Diagrams article.

LED lights up (voltage supply OK.):

- Remove fuel gauge sensor, See **FUEL DELIVERY UNIT, REMOVING AND INSTALLING** .
- Check that electrical wires between flange and fuel pump are connected and for continuity.

If no open circuit can be found:

- Fuel pump faulty, replace fuel gauge sensor, See **FUEL DELIVERY UNIT, REMOVING AND INSTALLING** .

Checking current draw of fuel pump

- Disconnect 4-pin connector on fuel gauge sensor.
- Set multimeter to measuring range 20 A and make a series connection between connector contacts -1- and fuel pump using adapter cables from V.A.G 1594 A.

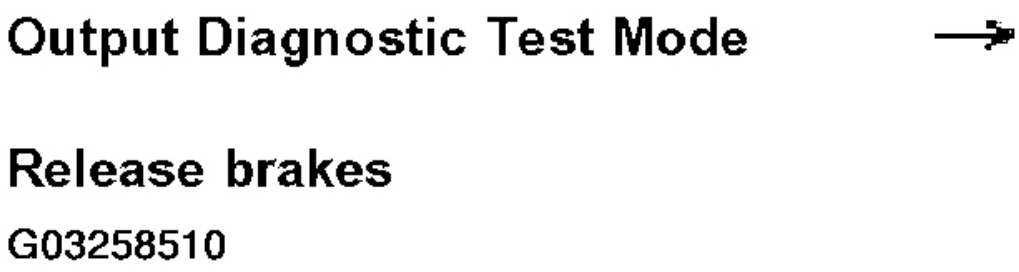

Fig. 24: Checking Current Draw Of Fuel Pump
Courtesy of VOLKSWAGEN OF AMERICA, INC.

NOTE: The current clamp of multimeter V.A.G 1715 can be connected between contacts -1- of connector and fuel pump, as an alternative solution.

- Bridge contact -4- of connector and fuel pump using adapter cables from V.A.G 1594 A.
- Start engine and run at idling speed.
- Measure current draw of fuel pump. Specification: 3.5 to 4.5 Amps

If the measured value is out of specification:

- Replace fuel gauge sensor, See **FUEL DELIVERY UNIT, REMOVING AND INSTALLING** .

DELIVERY PRESSURE AND DELIVERY RATE OF FUEL PUMP, CHECKING

NOTE: If irregularities occur when driving at high speed and:

- **no faults are stored in the control module DTC memory (see ENGINE CONTROL MODULE (DTC) MEMORY, READING AND ERASING).**
- **tandem pump is OK (See TANDEM PUMP, CHECKING)**
- **and fuel filter change intervals are kept,**

the delivery pressure and delivery rate of fuel pump must be checked.

Special tools and equipment

- 3217 Ring nut wrench
- V.A.G 1318 Pressure gauge
- V.A.G 1318/1 Adapter
- V.A.G 1318/11 Adapter
- V.A.G 1318/17 Adapter
- V.A.G 1318/23 Adapter

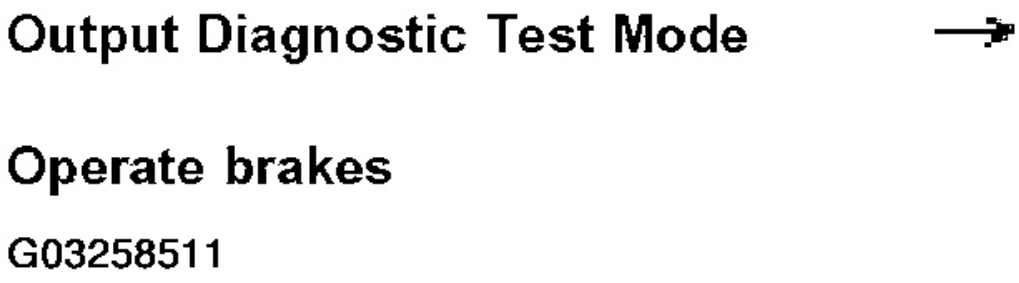

Fig. 25: Identifying Special Tools And Equipment
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- V.A.G 1348/3 A Remote control

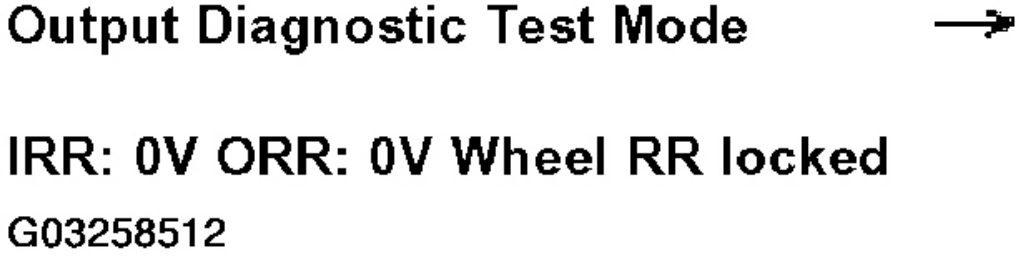

Fig. 26: Identifying Special Tools And Equipment (V.A.G 1348/3 Remote Control)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- V.A.G 1594 A Adapter set

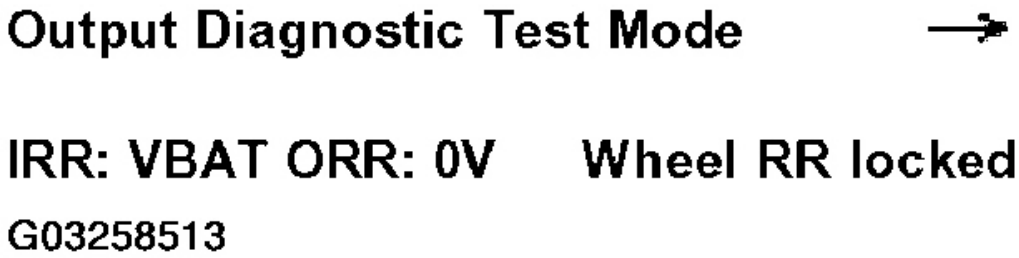

Fig. 27: Identifying Special Tools And Equipment (V.A.G 1594 Adapter Set)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Requirements

- Voltage supply OK.
- Battery charge at least 12.5 V
- Fuel temperature 15°C to 30°C
- Fuel according to DIN EN 590 - no biodiesel
- Fuel tank filled at least 1/4

Work sequence

Observe safety precautions, See **SAFETY PRECAUTIONS WHEN WORKING ON THE FUEL SUPPLY SYSTEM** .

Observe rules for cleanliness. See **RULES FOR CLEANLINESS** .

Connect remote control

- Remove cover from fuel gauge sensor.
- Disconnect 4-pin connector on fuel gauge sensor.
- Connect remote control V.A.G 1348/3 A with adapter cables from V.A.G 1594 A to fuel pump contact -1- and battery positive (+).
- Bridge contact -4- of connector and fuel pump using adapter cables from V.A.G 1594 A.

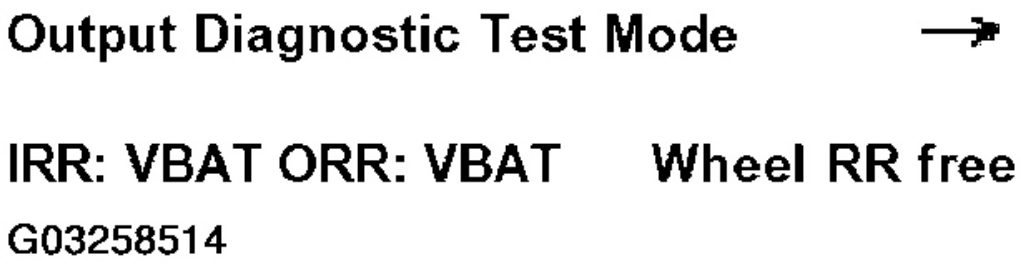

Fig. 28: Connecting Remote Control With Adapter Cables To Fuel Pump Connector
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Checking delivery pressure and delivery rate

- Pull fuel supply hose -1 - off fuel line at suspension strut and connect pressure gauge V.A.G 1318 with adapter V.A.G 1318/23 and V.A.G 1318/17-8 to fuel line.

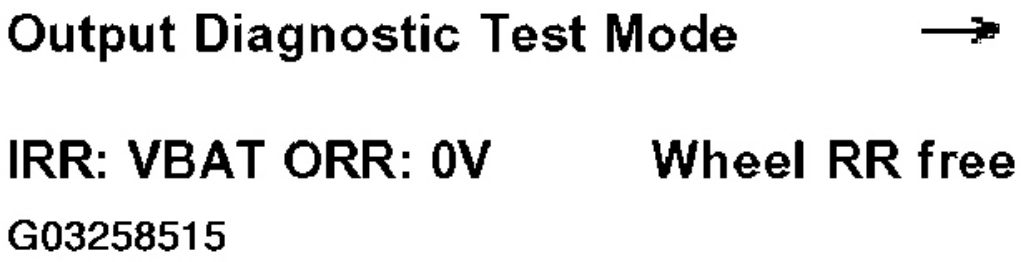

Fig. 29: Checking Fuel Delivery Pressure
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Push hose V.A.G 1318/1 onto adapter V.A.G 1318/11 on pressure gauge and hold hose in a measuring container.
- Close shut-off tap of pressure gauge (item -A-).
- Operate remote control again for approx. 5 seconds.

There must be measured a pressure of 0.5 +/- 0.1 bar in pressure gauge.

If delivery pressure is not achieved:

- Check fuel line to fuel gauge sensor.

If delivery pressure OK:

- Replace fuel gauge sensor, See **FUEL DELIVERY UNIT, REMOVING AND INSTALLING** .

When delivery pressure is achieved, check delivery rate as follows:

- Open shut-off tap on pressure tester. Lever then points in through flow direction -B-.

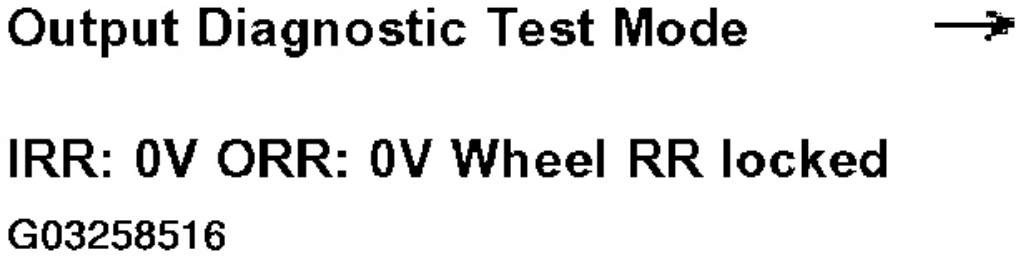

Fig. 30: Checking Fuel Delivery Rate
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Operate remote control V.A.G 1348/3A. Close shut-off tap slowly, until pressure gauge shows 0.2 bar pressure.
- Do not continue to operate remote control. From this point on do not move position of shut-off tap.
- Empty measuring container and position under drain hose again.
- Operate remote control for 30 seconds and measure fuel quantity.

  Specification: at least 660 ml/30 s.

If the minimum delivery rate is not attained:

- Check fuel line to fuel gauge sensor.

If delivery rate is OK:

- Replace fuel gauge sensor. See **FUEL DELIVERY UNIT, REMOVING AND INSTALLING** .

TANDEM PUMP, CHECKING

Special tools and equipment

- VAS 5187 Pressure gauge

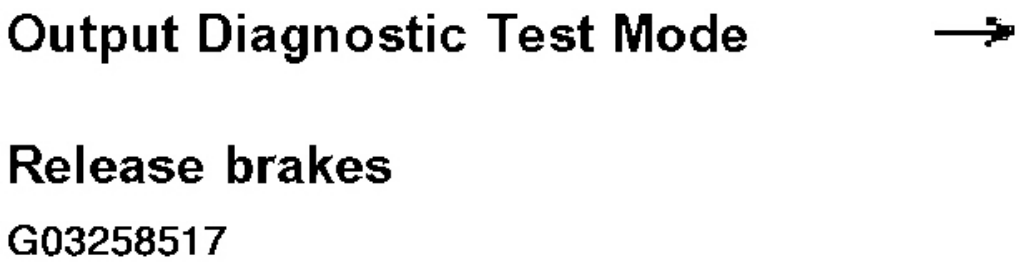

Fig. 31: Identifying Special Tools And Equipment (VAS 5187 Pressure Gauge)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- V.A.G 1331 Torque wrench (5 to 50 N.m)
- VAS 5051 Vehicle diagnostic, testing and information system with diagnostic cable VAS 5051/5A or VAS 5051/6A

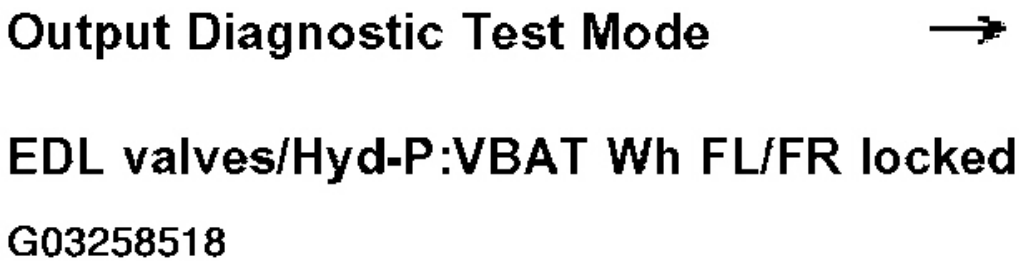

Fig. 32: Identifying Special Tools And Equipment (V.A.G 1331 Torque Wrench)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Requirements

- Coolant temperature at least 85 C
- Unit injectors OK

Work sequence

- Unscrew sealing plug (arrow).

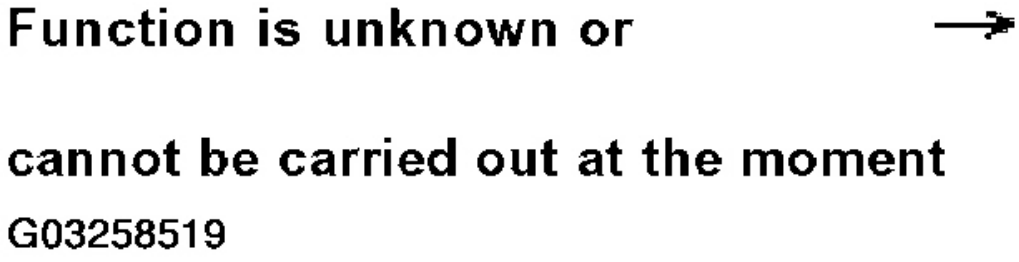

Fig. 33: Unscrew Sealing Plug On Tamdem Pump
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Connect pressure gauge VAS 5187 as shown in **Fig. 34** .

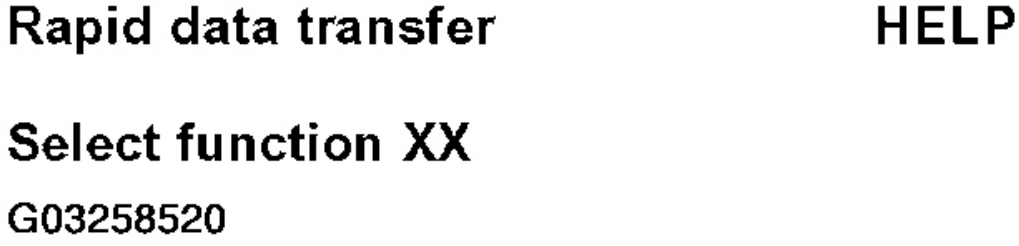

Fig. 34: Connecting VAS 5187 Pressure Gauge
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Start engine and run at idling speed.
- Connect vehicle diagnostic, test and information system VAS 5051 and select operating mode "vehicle self-diagnosis". Enter control module engine electronics with address word "01".
- Select diagnostic function "08-Read measured value block".
- Enter via number keys display group "2" and confirm with Q key.
- Read idling speed in display zone 1.
- Increase engine speed to above 1500 rpm.
- Observe indicated pressure on gauge.

Specification: at least 3.5 bar.

- Press <--key.
- Press function 06-"End output".
- Switch ignition off.

If specification is not obtained:

- Replace tandem pump. See **TANDEM PUMP, REMOVING AND INSTALLING** .

NOTE: Tighten the sealing plug to 25 N.m after having removed the pressure gauge. Always replace the sealing ring.

TANDEM PUMP, REMOVING AND INSTALLING

Observe safety precautions, See **SAFETY PRECAUTIONS WHEN WORKING ON THE FUEL SUPPLY SYSTEM** .

Observe rules for cleanliness, See **RULES FOR CLEANLINESS** .

Special tools and equipment

- V.A.G 1331 Torque wrench (5 to 50 N.m)
- V.A.G 1390 Vacuum pump
- V.A.G 1390/1 Fluid receptacle
- V.A.G 1921 Pliers for spring-type hose clips or VAS 5024 Assembly tool for spring-type clips

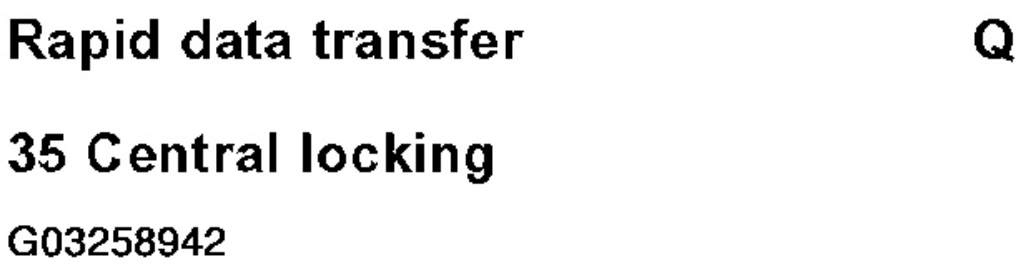

Fig. 35: Identifying Special Tools And Equipment
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Removing

WARNING:
- **The fuel and the fuel lines in the fuel system can become very hot**

(danger of scalding)!

- **The fuel system is also under pressure! Before opening the system, place cloths around the connections. Then carefully loosen the connection to release pressure.**
- **Wear eye and hand protection when performing any type of repair work on the fuel system!**

- Pull supply hose -1- (white marking) and return hose -2- (blue marking) off fuel lines on cylinder head.
- Attach hand vacuum pump V.A.G 1390 with bleed bottle V.A.G 1390/1 to return hose -3-.

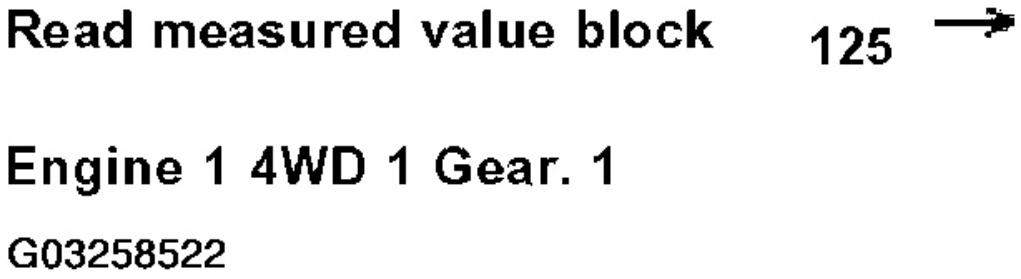

Fig. 36: Attaching Hand Vacuum Pump V.A.G 1390 With Bleed Bottle V.A.G 1390/1 To Return Hose
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Operate hand vacuum pump until no fuel is coming out of return hose. Observe that no fuel is siphoned into hand vacuum pump.
- Remove vacuum hose -1 - from brake booster of tandem pump -4-.
- Remove supply hose -2- (white marking) from tandem pump -4-.
- Remove securing bolts (arrow).
- Remove tandem pump -4- from cylinder head.
- Pull tandem pump -4- upward slightly, pull return hose -3- off (blue marking) and remove tandem pump -4-.

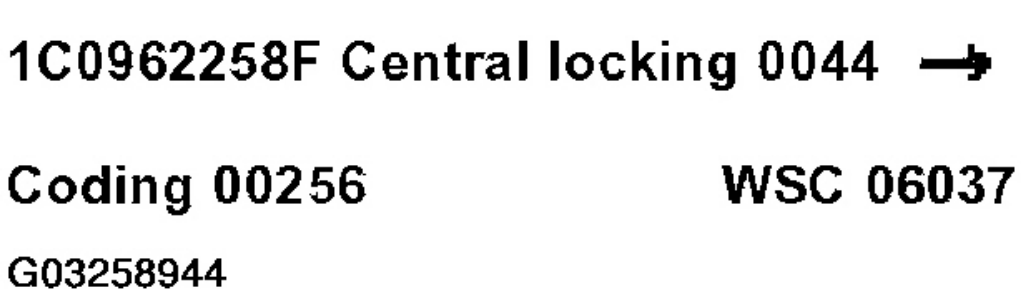

Fig. 37: Removing Tandem Pump Securing Bolts
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Installing

Installation is performed in reverse order. Note the following:

- Observe correct seat of tandem pump coupling in the camshaft.
- Always replace tandem pump seals.

- Connect return hose -3- (blue marking) to tandem pump return connection.
- Install tandem pump and tighten upper securing bolts to 20 N.m.
- Tighten lower securing bolts to 10 N.m.
- Connect supply hose -2- (white marking) to supply connection and vacuum line -1- of brake booster to tandem pump -4-.

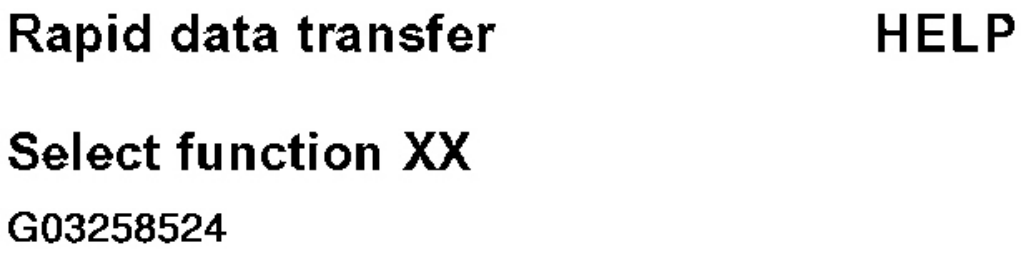

Fig. 38: Tightening Tandem Pump Lower Securing Bolts
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Connect supply hose -1- (white marking) to fuel line of cylinder head.
- Attach hand vacuum pump V.A.G 1390 with bleed bottle V.A.G 1390/1 to return hose -3-. See **Fig. 39** .
- Operate hand vacuum pump until no fuel is coming out of return hose -3-. Observe that no fuel is siphoned into hand vacuum pump.
- Connect return hose -2- (blue marking) to return hose -3-.

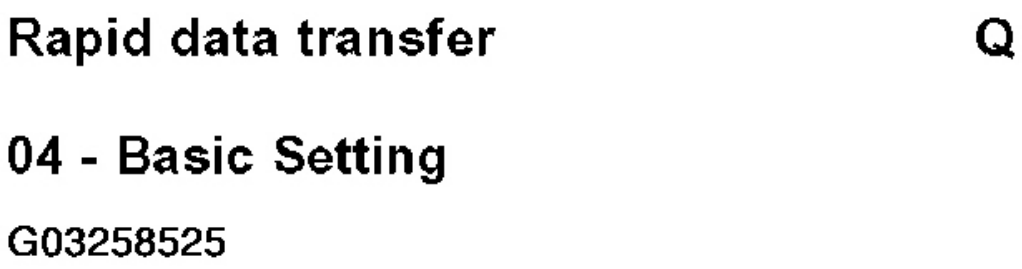

Fig. 39: Attaching Hand Vacuum Pump V.A.G 1390 With Bleed Bottle V.A.G 1390/1 To Return Hose
Courtesy of VOLKSWAGEN OF AMERICA, INC.

ACCELERATOR MECHANISM, SERVICING

NOTE: The following list refers to items in Fig. 40 .

1. **Mounting**
2. **Connector**
   - Black, 6-pin
3. **10 N.m**
4. **Throttle Position (TP) Sensor -G79-**
   - Can not be adjusted
   - Sensor passes position of pedal on to engine control module
   - Remove footwell cover to remove sensor
5. **Bracket**
   - For footwell cover
   - Clipped securely onto accelerator pedal (TP) position sensor

Fig. 40: Identifying Accelerator Mechanism Assembly
Courtesy of VOLKSWAGEN OF AMERICA, INC.